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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,575	09/30/2003	Leonard J. Olmer	BEVERS 2-3-16-20	9967
47396	7590	06/18/2008		
HITT GAINES, PC LSI Corporation PO BOX 832570 RICHARDSON, TX 75083				
EXAMINER HECKERT, JASON MARK				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
06/18/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@hittgaines.com

### Office Action Summary

**Application No.**

10/675,575

**Applicant(s)**

OLMER ET AL.

**Examiner**

JASON HECKERT

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7, 9-12, 14-20, 22, 24-26, 28 and 30-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 9-12, 14-20, 22, 24-26, 28 and 30-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 4/14/08 have been fully considered but they are not persuasive. The applicant has amended the claims to include the limitation of performing the nitrogen-gas exposure at a "pressure of about 275 Torr". However, Pomarede discloses that for the given temperature, pressure and other characteristics can be adjusted to achieve the desired surface conditioning (paragraph 0065). Absent the showing of unexpected results, the examiner considers pressure to be a cause effective variable of which an optimum value can be determined with routine experimentation. It is well settled that determination of optimum values of cause effective variables is within the skill of one practicing the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1-5, 7, 9-12, 14-20, 22, 24-25, 26, 28, 30-36 rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the art (ASA) in view of Pomarede. The admitted state of the art (applicant's specification 0003 – 0016) clearly discloses that it was known at the time of the invention to utilize a resistively heated chuck to stabilize the surface of a substrate at 700 deg C after forming a hydrogen

termination on the surface. The ASA also discloses that it is known to stabilize before and during deposition of the arsenic-doped polysilicon layer. The ASA also discloses an HF dip, RCA cleaning process, drying with IPA, nitrogen gas flow during deposition, and a hydrogen bake. The ASA does not disclose removing contaminants from the surface of the substrate prior to deposition of a second layer with nitrogen fluoride.

Pomarede discloses a method for treating a substrate, including one with an epitaxial silicon layer, prior to deposition of a second layer as well. The substrate is cleaned, using SC1 [RCE process]/HF bath, much like the ASA. A hydrogen bake is also an alternative. Both options leave a hydrogen terminated surface. Pomarede then discloses that NF<sub>3</sub> gas is introduced into the chamber. After the introduction of said gas, a deposition occurs between 500 – 800 deg C (0094). Pomarede asserts that it will be understood that the processing methods disclosed can be used with other heating systems, such as inductive or resistive heating systems (0037). The cleaning, introduction of gas, and deposition all occur in situ at relatively constant pressures. Pomarede discloses that this method can be used with arsenic-doped polysilicon deposition (paragraph 0102). Thus, Pomarede gives motivation for exposing a surface to NF<sub>3</sub> prior to deposition of a second layer. Whether or not said motivation is consistent with the applicant's is not an issue of patentability. Pomarede does not disclose exposing the gas at a pressure of 275 Torr. However, Pomarede discloses that for the given temperature, pressure and other characteristics can be adjusted to achieve the desired surface conditioning (paragraph 0065). Absent the showing of unexpected results, the examiner considers pressure to be a cause effective variable of

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which an optimum value can be determined with routine experimentation. It is well settled that determination of optimum values of cause effective variables is within the skill of one practicing the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). One skilled in the art would have found it obvious at the time of the invention to modify the ASA and inject NF3 gas prior to deposition of a second material layer, as disclosed by Pomarede, in order to facilitate subsequent deposition without any appreciable deposition during injection.

4. As stated above, Pomarede discloses that for the given temperature, pressure, reaction times, and reaction concentrations can be adjusted to achieve the desired surface conditioning (0065). Examiner feels that flow rate and duration fall under the obvious modifications Pomarede alludes to. Furthermore, as stated previously, it is well settled that determination of optimum values of cause effective variables is within the skill of one practicing the art. It would have been obvious at the time of the invention to modify the flow rate, concentration, or exposure time to achieve the desired breaking of surface bonds without significant bulk modification in order to obtain the desired conditioning.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON HECKERT whose telephone number is (571)272-2702. The examiner can normally be reached on Mon. to Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571)272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Barr/  
Supervisory Patent Examiner, Art  
Unit 1792

JMH